




# Flemish Sign Language Lexicography: Past, Present and Future

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with Mieke  
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# Overview

- Some background information
- The past
- The present/current activities
- The future
- To conclude: societal & technological developments

# Some background information

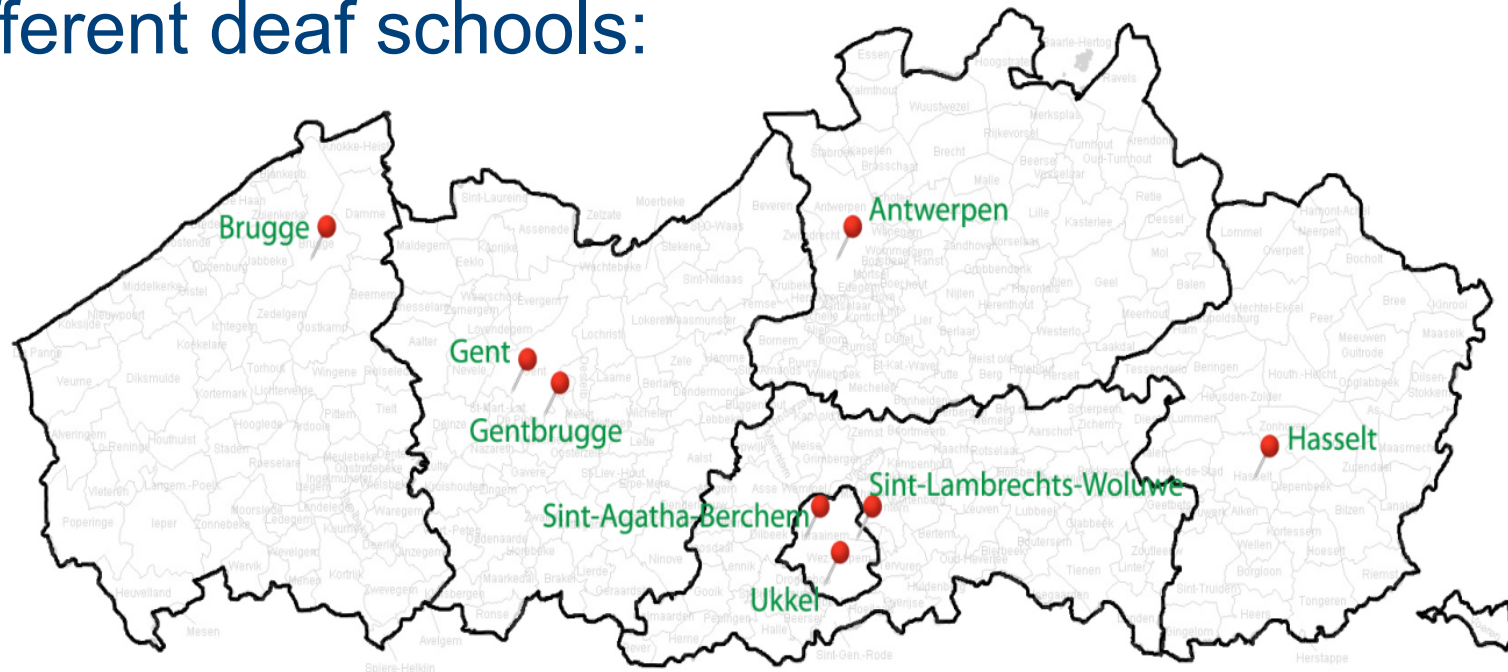
Flemish Sign Language – Vlaamse Gebarentaal – VGT:

- Sign language used in Flanders, northern part of Belgium (spoken language = Dutch)
- Clearly related to langue de signes de Belgique francophone (used in the southern part of Belgium)
- Flemish Deaf community: 5000 to 6000 signers
- Officially recognised by the Flemish Parliament in April 2006

(Decree on recognition includes recognition of “centre of expertise” = Flemish Sign Language Centre or VGTC)

# Some background information

Five geographical variants originating in the different deaf schools:



+ intra-regional variation (e.g. gender)

# Established signs and productive depicting signs

An example from Flemish Sign Language:



TO EAT



“eat-large-sandwich”

# Established signs and productive depicting signs

Lexical/established sign =

established form-meaning pairs (highly stable, used frequently in the language, entrenched symbolic units)

*“ready-made, off the shelf lexical items. They are already in existence: the signer simply has to pluck them from her/his mental lexicon and place them in the appropriate lexical contexts”.* (Brennan, 1992: 45-46)

Productive lexicon =

“mix 'n' match”-signs: resulting from a process that consists of:  
*“selecting the component parts and putting them together in appropriate ways to create particular kinds of effects”* (Brennan, 1990:163)



# Established signs and productive depicting signs

- Distinction not always clear-cut
- Different approaches:
  - Based on use, with notions such as “stability”, “conventionalisation”, “entrenchment” (e.g. Johnston, 2016; Ferrara, 2012);
  - Based on formal characteristics, e.g. complexity of form, syntactic behaviour (e.g. Engberg-Pedersen, 1993; Vermeerbergen, 1996; Vermeerbergen et al., 2007b);
  - On the basis of the signer’s intention, do signers want to ‘say’ something, or ‘show’ something (Cuxac, 2000).
- For VGT: work in progress (Vermeerbergen, 2016).

# THE PAST

# The origin: Signed Dutch dictionary

1979: first Flemish Deaf Federation conference:  
start of development of *Nederlands met Gebaren*  
(Signed Dutch)

- ⇒ lexical unification: “sign committee” selects so-called unified signs for 9200 Dutch words: signs from VGT as well as invented signs
- ⇒ Publication of a series of booklets (from 1981) + book (1983) “Woord en Gebaar”
- ⇒ publication of a Signed Dutch dictionary in 1995

# Signed Dutch

Mid 1990s:

- resistance against Signed Dutch and unified lexicon stronger and stronger
- more and more Deaf people want VGT promoted

⇒ March 1997:

- official rejection of the use of Signed Dutch
- official start of the promotion of VGT

⇒ search for funding for lexicographical research into VGT

# Early codification: risky business?

small-scale study: lexical influence from Signed Dutch on VGT (especially for gaps and perceived gaps)

Rapid impact of codification due to:

- Doubts about own linguistic competence (related to low status of VGT)
- Exceptional language acquisition situation of deaf children (importance of hearing late learners of VGT)
- Interpreters functioning as linguistic models (especially in the case of educational interpreting)

# Early codification: risky business?

small-scale study: lexical influence from Signed Dutch on VGT (especially for gaps and perceived gaps)

*“It seems that in a small linguistic community such as the Flemish Deaf community corpus and status planning activities can have a rapid impact. Sign language researchers should be aware of this.”*

(Van Herreweghe & Vermeerbergen, 2004)

# Online translating dictionary Dutch-Flemish Sign Language/Flemish Sign Language-Dutch

1999: Lexicographical research project into VGT:

- general aim: Documenting basic VGT lexicon
- additional aims:
  - verifying the existence of a standardisation process
  - determining the level of convergence of the different regional varieties
  - developing a two-way translating dictionary Dutch / VGT – VGT / Dutch

# Dictionary Dutch-VGT/VGT-Dutch: methodology

## Sign language lexicography: challenges:

*“First, there is **no orthography** for signed languages. (...) Second, in almost all countries there are only a **few signed sources** from which the meaning(s) and grammatical characteristics of signs can be deduced and frequencies can be calculated. Third, signed languages are quite **different from many spoken languages**, particularly from Indo-European languages. Because the sign language may have a complex structure where the spoken language has a simple word and vice versa, it is often rather difficult to give a sign-for-word or word-for-sign translation. Finally, sign language lexicographers have to overcome the legacy of a **tradition of (inadequate) compilation of sign language dictionaries** set by non-professionals.”*

(Zwitserlood, 2010:445-6)



# Dictionary Dutch-VGT/VGT-Dutch: methodology

- Deaf informants in regional teams, with Deaf moderators:
  - East Flanders
  - West Flanders
  - Antwerp
  - Flemish Brabant
  - Limburg(! Only 6 informants/team => not all signs recorded)
- Elicitation procedure: no link to Dutch: e.g. pictures, drawings, questions in VGT, etc.
- All conversations (in 6 rounds) were video-taped

# Dictionary Dutch-VGT/VGT-Dutch: methodology

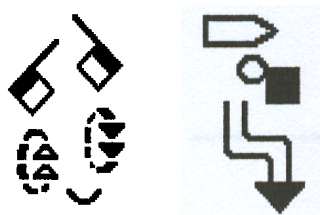
## List of concepts elicited:

the colours, the days of the week, the months of the year, the seasons, a number of temporal signs and question signs.

1. Family and friends, the body, health, hygiene, clothing;
2. Types of houses and buildings, furniture, cleaning material, kitchen utensils, parties and ceremonies, food;
3. Occupations and professions, at work, sports, holidays and free time, school;
4. The world, countries and cities, fauna, flora, traffic.
5. Finally, after having elicited signs in all of the above themes, it struck the researchers that hardly any abstract concepts had been elicited, so that a sixth list was added containing
6. Abstract concepts.

# Dictionary Dutch-VGT/VGT-Dutch: analysis

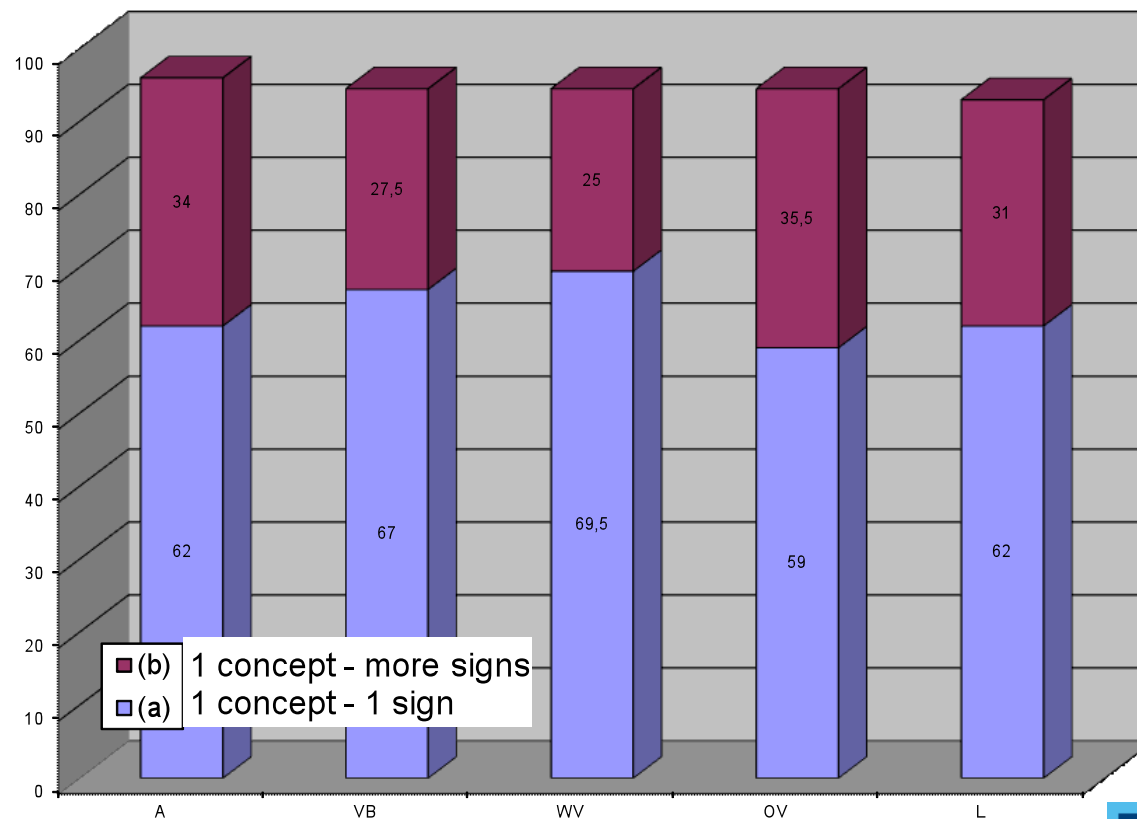
- Relevant signs extracted from conversations (in total more than 90 hours)
- Transcription to SignWriting ([www.signwriting.org](http://www.signwriting.org))



- Comparison and analysis of the corpus: on the basis of the manual parameters  
=> Four types of signs: identical, similar, related and different

# Dictionary Dutch-VGT/VGT-Dutch: results of the research

- 1401 elicited concepts, 9134 signs collected



# Dictionary Dutch-VGT/VGT-Dutch: results of the research

In general: 72,3% of similarity or relatedness

- For 540 concepts there is a common sign for the five regions
- For 33 concepts there is no sign in any of the regions
- For 828 concepts there are different variants spread over the regions of which:
  - 43% there are identical or similar signs
  - 12% there are related signs
  - 45% there are different signs

# Dictionary Dutch-VGT/VGT-Dutch: results of the research

## Standard VGT?

- No standard variety (or maybe not yet?)
- On-going spontaneous standardisation process (bottom-up)
- Imposed standardisation (top-down) not desirable (not even in the form of so-called preferred signs)

corroborates Fevlado's 1997 decision to reject imposed standardisation from above & promote spontaneous standardisation

# Dictionary Dutch-VGT/VGT-Dutch: inclusion or not?

Some tumbling blocks:

- Established or productive lexical element (e.g. TO BLOW)
- Phonemic or allophonic variation (e.g. AUGUST)
- Signs for occupations (e.g. SHOP^PERSON vs PERSON WORK SHOP)

# Dictionary Dutch-VGT/VGT-Dutch

<http://gebaren.ugent.be>

- First published in 2004, dvd in 2008
- Only established lexicon (no productive signs)



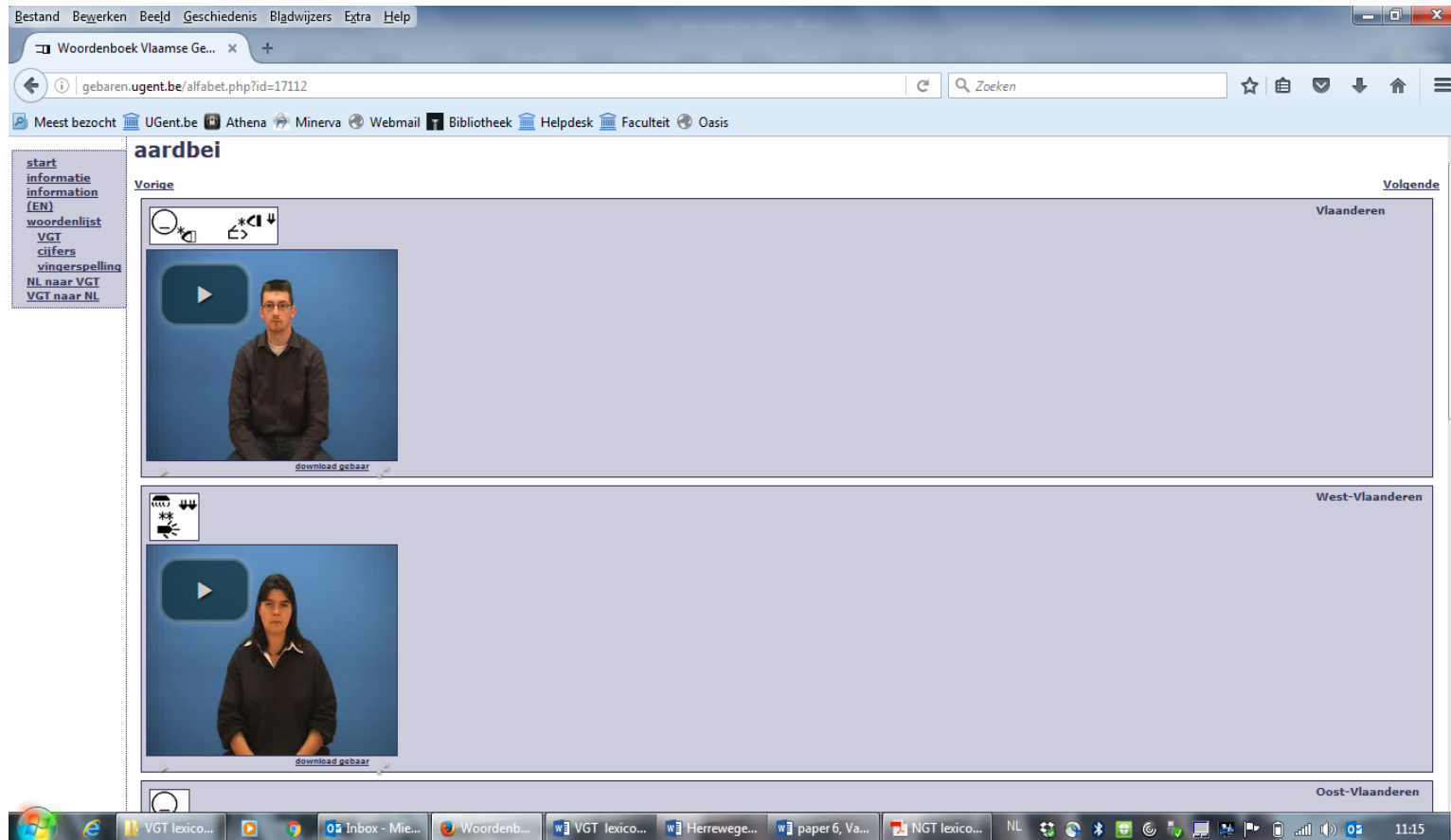
# Dictionary Dutch-VGT/VGT-Dutch

Signs rendered in shape of video clips & sign writing

Operates in two directions:

1. Dutch into VGT: click on Dutch word in alphabetically organised word list or type in (part of) a word in a search box => equivalent sign(s) for the word, including regional variants

# Dictionary Dutch-VGT/VGT-Dutch



# Dictionary Dutch-VGT/VGT-Dutch

Signs rendered in shape of video clips & sign writing

Operates in two directions:

2. VGT into Dutch: on the basis of some of the parameters of the sign, i.e. (1) handshape, (2) place of articulation and (3) type of contact.
  - For (1) user clicks on one of 107 SignWriting symbol(s) for handshape.
  - For (2) user clicks on head, torso, arms, hands, legs or on 'no contact'.
  - For (3) user clicks on six different types of contact (from touching, to sweeping, etc.).

# Lexical modernisation

Latter half of the 1990s: educators & educational interpreters confronted with (perceived) lexical gaps in educational practices. Consequences:

- They do not use a sign (only use mouthing)
- They avoid the subject
- They are not/partially aware of the possible exploitation of the productive lexicon
- They invent “ad hoc” signs
  - ⇒ different signs came into existence
  - ⇒ the Flemish Deaf community wants a solution

# Lexical modernisation

- 2001: Project in two stages:
  - Stage 1: mathematics
  - Stage 2: world orientation (= geography, history)
- Two project collaborators:
  - 1 deaf native signer
  - 1 hearing therapist/interpreter with experience in deaf education
- Steering committee:
  - Representatives of all deaf schools
  - Representatives of Flemish deaf federation
  - Sign language linguists

# Lexical modernisation

What is a lexical gap in VGT?

- No established sign
- But also = no productive (depicting) sign(s)

# Lexical modernisation

- Step 1: making priority lists
  - ca. 500 concepts for each domain selected (on the basis of handbooks, curricula, etc. for primary and first level of secondary education + questionnaire sent to teachers and interpreters)
- Step 2: verification
  - whether the concepts on the list really constitute lexical gaps
  - by asking a group of deaf “experts” in the domains
  - result:
    - 192 lexical gaps for math
    - 209 lexical gaps for world orientation

# Lexical modernisation

- Step 3: asking "experts" how they would sign the concept:  
most often: use writing/fingerspelling
- Step 4: looking for possible solutions
  - Borrowing from other sign languages
    - *Formula*
  - Depicting sign
    - *Radius, prefab*
  - Compound:
    - *Right angle, pilgrimage*
  - Fingerspelling:
    - *Least common multiple, Celsius*



# Lexical modernisation

- Step 4: looking for possible solutions (continued)
  - Paraphrase:
    - *Isosceles triangle*
  - Mathematical symbol:
    - $=$ ,  $cm^2$
  - Adoption of sign from the “Gebarenwoordenboek”
- Step 5: linguistic check: 2 signs rejected
  - *Concentration camp*

# Lexical modernisation

- Step 6: spreading the signs
  - <http://gebaren.ugent.be>, but flagged with “hiatenproject”
- Step 7: feedback
- Step 8: after 3 years: inclusion into the dictionary

! Participation of the Deaf community in all steps an absolute requirement

# THE PRESENT CURRENT ACTIVITIES

# Flemish Sign Language Corpus

- Corpus? Current meaning:
  - large **digital** collection of spoken, written or signed language data (+ associated **metadata**)
  - **machine-readable**
  - **maximally representative** of the language
- Building a corpus: two stages:
  - collect a digital video archive of recordings of sign language data (“data-collection + archiving-stage”)
  - annotate (+ translate) the data  
(+ lexical database)

# Flemish Sign Language Corpus

- 2012: start of Flemish Sign Language Corpus project
- Data from 119 signers:
  - women & men
  - 5 different regions
  - aged between 12 and 90
- Signers invited for elicitation session (+/-7 hours)
- Different language tasks (e.g. picture stories, free conversation, talking about past events, name sign, discussing procedures, giving directions, ...)

# Flemish Sign Language Corpus

Recording the data:

- informants recorded in pairs: paired with someone of similar age + familiar (but not family)
- Deaf moderator
- 3 cameras:
  - 1 on each informant
  - + overview



The screenshot displays the ELAN 4.9.4 software interface. The top-left pane shows a video of a man with grey hair and glasses, wearing a black shirt, gesturing with his hands. The top-right pane lists lexical items under the heading 'GlosRH 11', including terms like 'VERHAAL-E', 'OVER-A', 'G. (5, PALM OMHOOG) EUH', 'G. (5, wiggie) EUHM', 'KIKKER-A', 'G. (5, PALM OMHOOG) JA?', 'MEER-A', 'ALLEMAAL', 'DIER-D', 'VEEL-C', 'SWEET', 'VERBINDEN-A++', 'DIER-D', 'WG-3', 'JONGEN-A', 'SLAPEN-A', 'IN-B', 'SLAAPKAMER', 'DENKEN-A', 'WG-1', 'WG-3', 'SAMEN-A', 'KIKKER-A', 'WG-3', 'POT-C', 'IN-A (LOC. POT)', 'G. (palm links) IK-WEET-HET-NIET', 'WG-3POT', 'KIKKER-A', 'WILLEN-B', 'WEGLOPEN-A (AC)', 'GC. UIT-BOKAAL-SPRINGEN', 'GC. HOGER STAPPEN', 'VENSTER-I', 'VENSTER-E', 'GC. DOOR-HET-RAAM-SPRINGEN-EN-VALLen', 'WEG-E', 'AF-B', 'JONGEN-A', 'WORDEN-C', 'WAKKER-A', 'VAN-1', 'KIKKER-A', 'VERDWIJNEN-A', 'OPNIEUW-A (AC)', 'ZOEKEN-A', 'WILLEN-B', 'NAAR-A', 'ZOEKEN-A', 'TERUG-A', 'VINDEN-C', 'DENKEN-A-IK (SAMEN)', 'ROEPEN-C', 'WG-1', 'DENKEN-A', 'ONGEVEER-A', 'ROEPEN-C', 'HOND-A', 'HEBBEN-A++', 'TERUG-A', 'HELPEN-A', 'VAN-1', 'WG-3', 'GC. SPRINGEN-OVER-VENSTER', 'ZOEKEN-A', 'ONDERWEG-A', 'WAT-A', 'ONTMOETEN-A', 'WAT-A', 'ONDERWEG-A', 'DENKEN-IK (SAMEN)', 'UIL-E', 'ONTMOETEN-A', 'UIL-E', 'DENKEN-IK (SAMEN)', 'AREND-A', 'VOGEL-A', 'AREND-A', 'OF-A', 'VS. UIL', 'WETEN-NIET-A', 'DAN-A', 'GEBAREN-B', 'UIL-E', 'G', 'WG-1 (B)', 'DENKEN-A', 'WG-1', 'WG-3', 'GOED-B', 'TEKENEN-A (AC)', 'NIET-C', 'GOED-B', 'ZIEN-A', 'WG-3SCHERM', 'WG-1', 'ZELFDE-A', 'BEETJE-A', 'AANVALLen-A', 'VERLOOP-A', 'JUIST-A', 'VERDER', 'ZOEKEN-A', 'WG-3', 'DAN-A', 'BU-C (AC)', 'KORF-A', 'WILLEN-B', 'KUKEN-A', 'WG-3BLIJENKORF', 'GC. VERSPREIDEN-ZVERM-BUEN', 'BU-C (AC)', 'GC. VERSPREIDEN-ZVERM-BUEN', 'WG', 'WG', 'G. IK-TWIJFEL', 'WAT-A', 'WEGLOPEN-A (AC)', 'GC. WEGLOPEN', 'TWEEDe-A', 'DIER-D', 'VINDEN-C', 'HERT-B', 'ZELFDE-A', 'DENKEN-A', 'WG-1', 'HELPEN-B (AC)', 'WG-3 (B)', 'WILLEN-B', 'ZOEKEN-A', 'KIKKER-C', 'ZOEKEN-A', 'GC. NAAR-HOGER-GELEGEN-PLAATS', 'GC. OVER-TOP-EN-VALLen-IN-RAUJN', 'ZOEKEN-A??', 'HELPEN-A', 'G. ONGEVEER TOCH', 'G. NOU JA', 'ONGEVEER', 'GC. TUDVERLOOP', 'G. VERGETEN', 'VERDWIJNEN-A', 'DENKEN-A', 'WG-1', 'JA-A', 'WETEN-IK-A', 'LAATSTE-B', 'GC. (B) DEEL-VAN-VERHAAL', 'WAT-A', 'TERUG-A', 'VINDEN-C', 'KIKKER-C', 'ALLEEN-A', 'NIET-B', 'FAMILIE-A', 'ALLEMAAL', 'SAMEN-A (AC)', 'KINDEREN-A', 'VERBINDEN-A', 'KINDEREN-A', 'OOK-A', 'BLU-A (AC)', 'TERUG-A', 'VINDEN-C', 'WG-1', 'ZO', 'WG-1', 'ONGEVEER-NIET'.

The bottom pane shows a timeline with annotations. The timeline is divided into segments with labels such as 'GlosRH 11', 'GlosLH 11', 'repetitie', and 'repetitie 2'. The timeline also shows time markers and a red vertical line indicating the current position in the video.

# Flemish Sign Language Corpus

## Annotating the hands: **ID-glossing**

- Lexical signs annotated by means of glosses
- ! gloss = merely a label to identify & represent sign
- Johnston (2010 a.o.): importance of so-called ID glosses = unique sign identifiers: always same gloss for the same sign
- ID gloss used to represent sign in its citation form + phonological and morphological variants (e.g. GIVE)
- Different signs for the same concept = (slightly) different ID glosses (e.g. BALL-A, BALL-B or BAL-middenvinger vs. BAL-bol)
- ID glossing easier when lexical database exists; if no database: often ID glossing/annotating + building database (for VGT: Google sheet on shared Google drive ≠ full-blown lexical database)



# Elaboration of the dictionary

- Since 2012
- Flemish Sign Language Centre (VGTC)
- To large extent similar methodology:
  - Deaf informants in regional task forces with Deaf moderators
  - Different semantic fields (n=20) : 1) employment and unemployment; 2) geographical places; 3) emergency services, 4) technology; etc.
  - Elicitation materials no link to Dutch: e.g. pictures, drawings, questions in VGT, conversations on a certain topic; etc.

# Elaboration of the dictionary

- Targeted signs identified in recordings & re-filmed
- Glosses included in excel-files & thematically ordered
- Inclusion of signs in online dictionary

+ in case of doubt: (e.g. phonemic or allophonic variation?): advice will be sought from “expert committee”

# VGT Drop

2012: interpreting of the daily news and of *Karrewiet* (= daily news magazine geared towards children)

=> interpreters faced with “lexical gaps”

=>VGTC asked for advice & action

=>online forum using Facebook (“gebarenpagina”) started up and managed by VGTC: 30 VGT-users participated

- All signs collected this way passed on to VRT and saved in VGTC archives

# VGT Drop

- Issues:
  - Slow reaction
  - Perceived lexical gaps not always real lexical gaps
  - Too much based on one sign for one word strategy (= neglect of use of depicting signs or other strategies)
  - Gradually fewer and fewer reactions

=> discontinued

# VGT Drop

- Alternative:
  - VGT-Drop: crowd sourcing tool (cf. Wikipedia): [www.vgtdrop.be](http://www.vgtdrop.be).
  - Aim: create forum to publish specialised terminology
  - Potential problem: every one can post signs => need of “expert committee”

# The case of compounds

Compounding = process of creating new signs from two or more free morphemes, e.g. VGT PARENTS:



# The case of compounds

- challenge = determining when two signs represent a compound or a collocation (i.e. two signs that appear together frequently but do not represent a lexeme).
- Suggestion:  
*“whilst collocational pairs may look like compounds, their meaning remains predictable. That is, the meaning that is derived from the combination of the signs MAKE and TRUE is not novel and can easily be predicted. Only when such combinations take on broader, unpredictable meanings can we consider them as unique lexemes.”* (Fenlon et al., 2015: 190)

# The case of compounds

- Additional issue: loan translation, e.g. BATH^ROOM: based on equivalent compound word (?)
- Novel loan translation = coping strategy when lexical gaps, e.g. FRIET^CHINEES
- (Novel) loan translation => interesting creations, e.g.  
placenta: MOEDER (MOTHER) + KOEK (BISCUIT): iconic depiction of KOEK doesn't 'fit' overall meaning, cf. Fenlon et al. (2015: 196):  
*“both the BSL signs HANGING and HANGOVER depict someone being hanged by the neck. With HANGOVER, this is not an iconic depiction, because the form has no bearing on the meaning of being ill due to excessive drinking. Instead, what has happened here is that semantic extension has occurred with HANGING based on the English word ‘hang’ which comprises part of the word ‘hangover’.”*



# THE FUTURE

## Lexical database / monolingual dictionary

- Flemish corpus team: all ID-glosses collected in one single Excel Google sheet
  - VGTC team (expansion of dictionary): every team member own Excel files, with different sheet/theme: comparison very time consuming
- ⇒ Plans to develop lexical database using Signbank  
(Cf. Signbank for AUSLAN (Johnston, 2001), BSL (Fenlon et al., 2014) and NGT (Crasborn et al., 2016)).
- + desire to develop general purpose monolingual dictionary including information on different meanings and usages of lexemes (additional funding needed)

# Automatic gesture/sign recognition

- PhD project started in January 2015 (Pigou et al., 2016)
- Objective: signers produce sign in front of camera  
=> online dictionary detects which sign  
=> provides meaning(s) (monolingual dictionary) or translation(s) (bilingual dictionary)
- Deep Learning Approach
- successful SLR only expected in medium term

# TO CONCLUDE

# Societal & technological developments

- Looking back: both societal & technological developments have shaped VGT lexicography
- Technology:
  - e.g. printed dictionary including drawings => online dictionary including videoclips => bi-directional searches possible
  - + use of corpus (“corpus mining”) & advances in automatic sign recognition

# Societal & technological developments

- Societal developments:
  - Changed status of VGT: from NmG to VGT => from NmG dictionary to VGT dictionary
  - Consequences of the recognition of VGT, e.g. “VGT on TV”
    - Needs of the interpreters => VGT Drop
  - Use of VGT in education => need for lexical modernisation

# Societal & technological developments

! societal changes & technological advances

⇒ changes related to sign language uses & practices

⇒ impact on language itself, e.g.:

- signers more actively involved in hearing society => use of VGT in many more different semantic domains=>exponential growth of lexicon
- diminishing importance of deaf schools+ increased contact between deaf from different regions=>major impact on spontaneous standardisation process
- sign languages increasingly used for remote communication may in time impact on structure of the language

# Societal & technological developments

*“All natural languages evolve, which implies that a constant revision of lexicographical research and outcomes is necessary. It seems that, like many other sign languages, Flemish Sign Language is experiencing particularly interesting times, with important societal changes related to its uses and practices resulting in rapid changes. This, together with technological advances, may give rise to inspiring new lexicographical initiatives. We are convinced that there is much to look forward to when it comes to the future of sign language lexicography.”*

(Vermeerbergen & Van Herreweghe, under review)



# Thank you

References available on request:  
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